INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year:	**Park:**	**Select the type of permit this report addresses:**
2002	Shenandoah NP	Scientific Study

Name of principal investigator or responsible official:	**Office Phone:**
Matthew Etterson	218-529-5158
Mailing address: U.S. Environmental Protection Agency Mid-Continent Ecology Division 6201 Congdon Boulevard Duluth, MN 55804 US	**Office FAX** 218-529-5003 **Office Email** etterson.matthew@epa.gov

Additional investigators or key field assistants (first name, last name, office phone, office email)

Name: Russell Greenberg **Phone:** 202-673-4908 **Email:** greenbergr@nzp.si.edu

Project Title (maximum 300 characters):

A Hierarchical Model of Avian Response to Forest Fragmentation

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00263	SHEN-2002-SCI-0008	Apr 15, 2002	Aug 15, 2002

Scientific Study Starting Date:	**Estimated Scientific Study Ending Date:**
Apr 15, 2002	Aug 15, 2002

For either a Scientific Study or a Science Education Activity, the status is:	**For a Scientific Study that is completed, please check each of the following that applies:**
Suspended	__ A final report has been provided to the park or will be provided to the park within the next two years __ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park __ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:

Research

Subject/Discipline:

Birds / Ornithology

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

ABSTRACT Many forest-breeding birds are sensitive to habitat fragmentation, showing poor reproductive success, poor mating success, declining populations, or even local extinction in fragmented landscapes. Forest fragmentation affects bird populations through both edge effects and area affects. Edge effects include nest parasitism and increased predation. Area effects include reduced mating success, reduced patch-specific productivity, and reduced habitat diversity. These processes are likely to operate on different scales. Historically, avian response to habitat fragmentation has been measured at the population or patch-level. More recently research has focussed on collecting habitat-specific demographic data. However, analysis is still often performed at the patch-level and may confound processes operating at different scales. I will produce a thorough review of experimental design and statistical techniques used in empirical studies of forest fragmentation. This will provide the basis for development of a hierarchical model for the effects of fragmentation on bird populations that nests edge effects within area effects. The model will be developed using data

collected over the last five years in Ohio and will be independently validated using data I will collect in Virginia. This method will provide a direct comparison of the efficiency of treating nests as points with demographic attributes versus testing demographic attributes of populations for determining edge-related effects on nesting success. It will also provide a more powerful model for testing and for predicting the effects of forest fragmentation on avian demography.

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

No activity was conducted this report year

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average 1.625 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3127 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.